



THE UNION OF SOVIET SOCIALIST REPUBLICS

THE STATE COMMITTEE OF INVENTIONS AND DISCOVERIES
AT THE USSR STATE COMMITTEE OF SCIENCE AND ENGINEERING
(THE STATE COMMITTEE OF INVENTIONS)

INVENTORS CERTIFICATE

No 1522466

On the basis of commission by the USSR Government, the State Committee of Inventions has issued the following inventors certificate on the invention:

„The Intestinal Endoscope”

The author (authors): **Matasov Sergey Alexandrovich**

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FEB 20 2003

TECHNOLOGY CENTER R3700

The applicant: **the same**

Application №: **2657091**

Priority of the invention: **August 21th, 1978**

Registered in the USSR State register of inventions

on July 15th, 1989

The effect of inventors certificate is applied on the whole territory of the Union of SSR.

The
Seal

Chairman of Committee:

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30.01.03

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[Signature]

(19) SU (11) 1522466 A1

(51) 4 A 61 B 1/00

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OF INVENTIONS AND DISCOVERIES
AT THE USSR SCSE

DESCRIPTION OF THE INVENTION TO THE INVENTORS CERTIFICATE

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(21) 2657091/28-13
(22) 21.08.78
(75) S.A.Matasov
(53) 615.475 (088.8)
(56) Prospect of "Olympus" company, Japan, 1978, p.7
(54) (57) An INTESTINAL ENDOSCOPE, comprising a light pipe with flexible working part, a control block of functioning of last named, a light source and an ocular, differing in that for the purpose of providing the possibility of atraumatic endoscope's insertion, it is supplied with a device for propulsion of light pipe, which include the thin-walled

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elastic tube and a source of excess pressure, but on the working end of the light pipe a projection is made, at that one end of thin-walled tube is movably fixed on the light pipe, but the other one is everted and by help of seal is movably placed on the last named, forming between the parts of the thin-walled tube a closed cavity, connected with the source of excess pressure, at that the adjacent to the light pipe part of the thin-walled tube is executed as pleated and spring-loaded, but the place of its transition in the everted part is limited by the projection of the light pipe.

The invention relates to medicine, namely to the devices for endoscopy of hollow organs, particularly of the gastrointestinal tract.

There is known an intestinal endoscope, comprising a light pipe with flexible working part, a control block of functioning of the last named, a light source and an ocular. Mostly flexible in this endoscope is the working part of endoscope.

The lack of the known intestinal endoscope lies in the fact, that it does not fully deliver nor patient, neither endoscopist from the necessity to execute rather laborious and complex, and sometimes even traumatic and prolonged methods of its insertion into the gastrointestinal tract sections, non-fixed in a definite position. The informativity of such endoscopy is often low.

The aim of the invention is ensuring of atraumatic insertion of endoscope.

This aim is achieved in such a way that a in the intestinal endoscope, comprising a light pipe with flexible working part, a control block of functioning of the last named, a light source and an ocular, distinctive feature lies in fact, that it is provided with a device for propulsion of light pipe, including thin-walled elastic tube and the source of excess pressure, but on the working end of light pipe the projection is made, at that one end of thin-walled tube is movably fixed on the light pipe, but the other end is everted and by seal is movably placed on the last named, thus forming closed cavity between the parts of thin-walled tube, said cavity is connected with the source of excess

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pressure, at that the part of the thin-walled tube adjacent to the light pipe, is executed as pleated and spring-loaded, but the place of transition in the everted part is limited by the projection of the light pipe.

On the drawing there is presented the general view of intestinal endoscope.

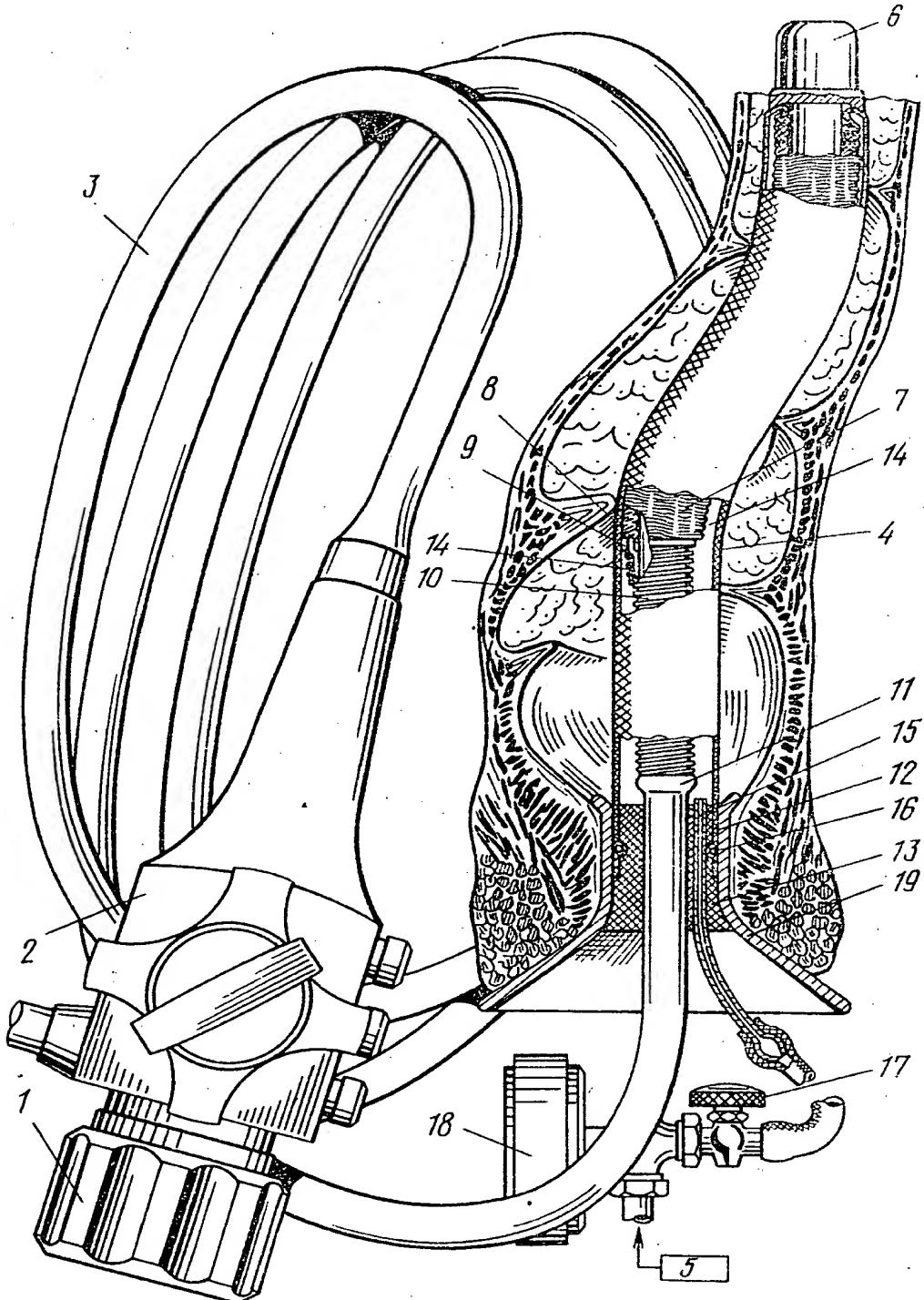
The intestinal endoscope comprises the ocular 1, the block 2 for control over the flexible working part and the light pipe 3. The endoscope has the device for propulsion of light pipe 3 inside the examined cavity, which includes the thin-walled elastic tube 4 and the source 5 of excess pressure, but on the working end of light pipe 3 the projection 6 is made. The end 7 of the tube 4 is movably fixed on the light pipe 3 with the help of rings 8 and 9, is executed as pleated and is spring-loaded by spring 10, which one is rested on the projection 11 of the light pipe 3. The other end 12 of the tube 4 with the help of seal 13 is also movably placed on the light pipe 3 and everted, thus forming the closed cavity 14 between the parts of tube 4, connected through the airway 15 with the source 5 of excess pressure. The end 12 of the tube 4 is hermetically fixed by the ring 16 on the seal 13, but the place of transition of pleated part of tube into the everted one is limited by the projection 6.

The assembling of intestinal endoscope is executed through the working end of the light pipe 3 released from all details. Over it, passing the /stop/ projection 11 of the light pipe 3, the sliding seal 13, the spring 10, the rings 8 and 9, the thin-walled elastic tube 4 are putted. The closest to uneveted end part of tube is putted on the ring 8 and is fixed on it by the ring 9, but the uneveted end itself is placed under the coils of spring 10. Having gripped tightly the tube 4 and the spring 10 and thus baring the working end of light pipe 3, the /stop/ projection 6 is fastened to it. The cavity between the pleated and everted parts of tube is poured in with the antifriction powder and the end 12 on the seal 13 is fixed with the help of ring 16.

The insertion of intestinal endoscope into the gastrointestinal tract is implemented in the following way.

Having reached by regulator 17 with the help of manometer 18 the necessary safe level of working pressure in the cavity 14, the working part of endoscope is inserted through the anal dilator 19 into the rectum 20 and its examination is realized. After approaching of seal 13 to the anal dilator 19, the seal is pressed in it. Then, under the control through the ocular 1 and the correction by the control block 2 of the position of working part of endoscope, the manual insertion of flexible light pipe 3 is begun in the seal 13. Simultaneously with the beginning of insertion of flexible light pipe 3 under the action of air pressure there begins the eversion and the transition of pleated part of thin-walled elastic tube, gathered on the light pipe 3, into the everted part. Thus being everted and invaginated into the gastrointestinal tract, the everted part 12 of tube 4 under the air pressure action is trying to become straight, to fix on itself the non-fixed sections of intestine in the definite position and thus to turn into the channel with dense walls, smooth bends and resilient, few-displaced axis. The prevalence of rigidity of the longitudinal axis of the everted part 12 of the thin-walled elastic tube 4 over the rigidity of the light pipe 3 ensures its insertion into the filled with air cavity 14 and realization of endoscopy of gastrointestinal tract. The pressure of the transition place of the pleated part of tube 4 in its everted part 12, inflated by the air of cavity 14, on the projection 6, make easier the manual insertion of the external part of the light pipe 3. When the difficulties appears with the insertion of the light pipe 3 into the sliding seal 13, there is necessary to reduce on few seconds the pressure to zero and then repeatedly raise it till the working level and to continue insertion of the light pipe. In the moment of absence of pressure the pleated part of tube does not cuddle to the light pipe and under the action of spring 10 is able to displace to the projection 6 on the place of tube, which has turned into everted part.

The use of the invention allows to facilitate and to fasten the procedure of insertion of endoscope and will ensure its atraumatic insertion without friction on the tract mucosa.



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Compiler T. Konopljannikova
Technical editor L. Serdjukova Proof-reader L. Beskid

Order 2177 / DSP

VNIUPI of State Committee of Inventions and Discoveries at the USSR SCSE
113035, Moscow, Z-35, Raushskaja, 4/5

Circulation 508

Subscription

Production-publishing centre "Patent", Uzhgorod, Gagarina st., 101